

Optical Signal Routing by Polarity Uniforming and Trajectory Deviation Amplification without Signal Reprocessing

Pierre L. Coulomb
2026 June 2

Re-routing signals traveling through fiber-optics, for example, in the context of an ISP routing traffic, typically requires that signals be processed and then re-transmitted through a separate light emission. This creates a great deal of cost-overhead for the ISP and introduces latency to the network.

Without fundamentally changing the backbone fiber, the re-routing of optical data traffic could be achieved in a novel and more efficient manner using a new type of junction which relies upon yet another implementation of glass nanospheres.

In this case, incoming optical traffic, which is generally omni-polar, would be polarity-uniformed using a localized magnetic field specific to each strand of fiber. After passing through a polarity-uniforming mechanism, the uniformed light would enter a mechanism which is ringed around its diameter with a semiconductor material. As the light would be polarity-uniformed but not phase-uniformed, half of the light redirected down a particular optical path would be redirected down another path in 180 degrees of opposition to it, but this loss of amplitude could be recouped by merging the fibers which are in 180 degrees of opposition in a subsequent step.

The magnetic field generated by interaction between the light and the atomic-scale semiconductor ring would nudge the waves of light in a direction determined by the low-intensity magnetism of the dopant material, most likely composed of a semiconductor. Although this nudge would be sub-angstrom, the direction of the deviation in trajectory would be multiplied through interaction of the light with the glass nanospheres, which would be centered within the fiber of the switching mechanism. In a sense, the light itself would be used as the energy source for producing the deviation to its own trajectory, aided by the semiconductor.

After passing through a mechanism consisting of several nanospheres, light would arrive at one of several possible fibers on the opposite side of the junction.

Routing traffic in this manner would have a number of advantages. For one, it would not be necessary to run the entirety of the signal through a processor, which would reduce cost. For another, it would become possible to use the magnetic polarity-control mechanism in order to route traffic according to the predicted time of arrival of packets from a particular user or set of users. This would entail a certain degree of processing of packets moving through the network, but not the analysis or handing of each and every individual packet. Once a pattern has been established associated with a particular user, the system could make some basic assumptions about when subsequent packets would be received unless it receives a special packet indicating that this

timing is likely to change (similar to the difference between a frame and a keyframe in compressed video.)

A modestly accurate precision timing mechanism capable of tracking the timing patterns associated with a large number of users would be necessary in order to manage this routing system, which would essentially allow for traffic to be sent “non-stop” rather than with a series of layovers, to use a commercial aviation metaphor. Only the timing control packets would need to be processed by the ISP data routers. End-users would tell the ISP where they want traffic to go and the ISPs would tell the end-users *when* each packet should be sent, precisely, in order to ensure it is routed properly (a bit like a windmill obstacle in a round of miniature golf which tells you precisely when to hit the golf ball.)

For bespoke applications such as packet scattering and reintegration, this mechanism could be used in a different mode of operation in which traffic would be rapidly and securely re-routed via as many diverse routes as possible so that the entire body of data is not sent through any single route. As ISP-level monitoring systems can be leveraged by nation-state adversaries for eavesdropping purposes, this routing protocol would give high-level users the ability to communicate in a manner which ensures that sent packets are not stored and, instead, are sent directly to the destination.

Knowledge of the expected timing of data would enable a user to know if eavesdropping were occurring as this protocol would have a unique latency related only to the total distance of fiber between the two communicating nodes rather than dependent upon ISP-based re-transmission of the data. ISPs would have an implicit knowledge of the physical location of users communicating with one another (based upon travel time through the fiber) and when, but would have no knowledge of the content of the data so long as the “non-stop” routing system were in use.